



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/936,429

09/13/2001

Masayuki Hoshino

L9289.01184

4483

24257

7590

01/19/2005

STEVENS DAVIS MILLER & MOSHER, LLP  
1615 L STREET, NW  
SUITE 850  
WASHINGTON, DC 20036

EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/936,429

Applicant(s)

HOSHINO ET AL.

Examiner

Qutub Ghulamali

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/6/2001.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. Figures 1-5B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

2. Claim 9 is objected to because of the following informalities: Claim 9, line 3, "acquainting", should this be -- acquiring or acquisition --? Appropriate correction is required.

### *Specification*

3. The disclosure is objected to because of the following informalities: The description, page 3, lines 14-15, shows "with remarkable phase rotations every slot....". It is not clear what is meant by "with remarkable phase rotations every slot....".

Appropriate correction is required without introducing new subject matter to the disclosure.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 7 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Suenaga et al (US Pub. No. 2003/0137964). Suenaga discloses satellite broadcasting system comprising: a plurality of antenna elements which are spatially arranged away from each other (col. 4, section 0038, lines 1-11); means for acquisition (reception means) of feedback information included in signals transmitted from a communication end (col. 4, section 0035, section 0038); distributing means (means for spreading) for distribution of phase rotations (phase, which said feedback information indicates, to each of said antenna elements (Abstract; col. 2, section 0032); and diversity transmitting means for diversity transmission after phase rotations are added to each of signals transmitted from said antenna elements, using said distributed phase rotations (col. 2, section 0033; col. 3, section 0033, continuation).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2637

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

7. Claims 2, 5, 6 and 8, are rejected under 35 U.S.C. 103(a) as being unpatentable over Suenaga et al (US Pub. No. 2003/0137964) in view of Alamouti et al (US Patent 6,185,258).

Regarding claims 6 and 8, Suenaga teaches all the subject matter with respect to claims 6 and 8, as applied to claims 1, 7 and 9 above, except the claimed subject matter “means for obtaining channel estimation values for signals from each antenna elements, using common known signals by radio transmission from a plurality of antenna elements provided in a transmission apparatus connected through a radio channel to a local apparatus; and means for calculation of feedback information based on said channel estimation values”.

In the same field of endeavor, however, Alamouti discloses, means for obtaining channel estimation values (fig. 4, element 53) for signals from each antenna elements (fig. 4, elements 51, 51), using common known signals by radio transmission from a plurality of antenna elements provided in a transmission apparatus connected through a radio channel to a local apparatus (Fig. 4, element 50) and means for calculation of feedback information based on said channel estimation values (col. 4; lines 25-33; col. 6, lines 57-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system of channel estimation and calculation taught by Alamouti in the system of Suenaga because it would reduce the fading and provide receptive diversity gain for effective communication.

With reference to claim 2, Suenaga is silent regarding the claimed subject matter “smaller phase variance in received signals at the side of a communication end...of said phase rotations”.

However, a person of ordinary skilled in the art would have understood that the spread in phase variation must be kept small in order to properly establish spreading code synchronization.

Therefore, the claimed subject matter “smaller phase variance in received signals at the side of a communication end...of said phase rotations” would have been obvious to one skilled in the art.

Regarding claim 5, even though Suenaga does not disclose the claimed subject matter “characterized in that said transmitting means gradually adds phase rotations to transmitting signals.” explicitly, a person of ordinary skilled in the art would have understood that gradually adding phase rotations (shifts) to transmitting signals can mitigate the effects of phase variation in the case of transmission of signals for improved reception at the other end. Therefore, the claimed subject matter “characterized in that said transmitting means gradually adds phase rotations to transmitting signals” would have been obvious to one skilled in the art.

#### *Allowable Subject Matter*

8. Claims 3, 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2637

### **US Patents:**

Jones et al (US Patent 6,654,340 B1), discloses system and method for optimally receiving differential encoded signals via multiple antennas.

Kim et al (US Patent 6,671,251B1), discloses channel spreading in a CDMA communications system.

Bolgiano et al (US Patent 5,663,990), discloses a wireless communication system combine time and space diversity to reduce fading and simplify receiver design.

Bottomley (US Patent 5,796,788), shows a method and apparatus for interference de-correlation in time and space.

Wang et al (US Patent 6,167,243), discloses diversity combining in a communication system.

Sousa et al (US Patent 5,832,044), shows transmitter antenna diversity modulation for wireless communication system.

Elam (US Patent 6,823,021 B1), discloses method and apparatus doe space division multiple access receiver having a plurality of receive elements.

### **Publications:**

Paulraj, A., Taxonomy of space-time processing for wireless networks, IEE Proc--Radar Sonar Navig., vol. 145, No. 1, Feb. 1998.

Winters, Jack l., "Signal Acquisition and Tracking with Adaptive Arrays in the Digital Mobile Radio System IS-54 with Flat Fading", IEEE 1993.

Winters, Jack l., "Signal Acquisition and Tracking with Adaptive Arrays in WirelessSystem", AT & T Bell Laboratory, IEEE 1993.

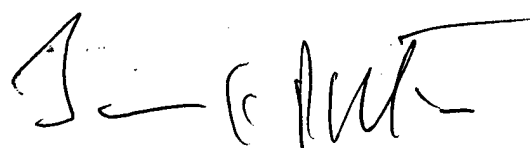
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014.

The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG  
January 12, 2005.  
1.



JAYANTI PATEL  
SUPERVISORY PATENT EXAMINER